ROCK CHURCH SUSPENSION BRIDGE
Texas Historic Bridges Recording Project II
Spanning the Paluxy River
Tolar vicinity
Hood County
Texas

HAER No. TX-81

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HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C St. NW
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HISTORIC AMERICAN ENGINEERING RECORD

ROCK CHURCH BRIDGE HAER No. TX-81

Location: Spanning the Paluxy River at Rock Church, Tolar vicinity
Hood County, Texas
UTM: 14/597632/3574157
USGS Quad: Paluxy, Tex.
(7.5-minute series, 1961)

Date of Construction: ca. 1917

Present Owner: On private property.

Significance: One of the remaining vernacular suspension bridges in Texas, the Rock Church bridge is an example of a combination cable and stayed truss, an obsolete engineering design.

Historian: Peggy Hardman, Ph.D., August 2000

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INTRODUCTION

The Rock Church Bridge spanning the Paluxy River at Rock Church, Texas, is one of several cable suspension bridges in the Paluxy River Valley.[1] Called a "swinging bridge" by local residents when built, such structures enjoy a long history. Before the use of pipe and wire cable, residents needing to span rivers and large creeks often constructed swinging bridges from rope and timbers to allow access back and forth across the water. Most of those primitive structures allowed only pedestrian use. When Rock Church residents decided they wanted a more permanent structure across the river, a bridge able to carry their "buggies" as well as their children back and forth from the Rock Church School, they chose the cable suspension bridge.[2]

BRIDGE TYPE

The Rock Church Bridge is a single span suspension bridge with diagonal stay cables. The superstructure of cable-stayed bridges is supported by twisted wire cable or wrapped bundles of parallel cable (stays) passing over, or attached to, towers at the main piers. The cable at Rock Church consists of a bundle of parallel strands of 9-gauge galvanized steel.

The main span of the Rock Church suspension bridge is 100' in length. The unstiffened deck measures 13'-0" x 5"-0" from outside member to outside member. Deck timbers are 3" x 10", and are replacement timbers. At one time, two timber approach spans led to the bridge from the northwest. Only the concrete abutments remain there today. (This is the Caraway side of the bridge today. Ranchers leasing the land for their cattle removed the approaches to prevent the cattle from going onto the bridge.)

The portal towers, over which the cables pass resting in cast-iron saddles, are approximately 16'-0" in height. These metal towers, 15'-11" apart, vary in diameter from 14-1/2" x 5-1/2", and are concrete-filled. Rivets on the towers are conical in shape. Metal collars attached to the cables hold the wires in place, and form the top of the metal suspender rods.[3] The

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[1] The Paluxy River is sometimes referred to as Paluxy Creek.

[2] Forest E. Caraway, interview with author, 27 July 2000, Austin, Texas, telephone. Mr. Caraway's family, one of the first to settle in the area, donated the land for the bridge and roadway, as well as the land for the original Rock Church, in 1859. See also, *The New Handbook of Texas,* vol. 3 (Austin: The Texas Historical Commission, 1996), 631.

[3] A good example of the parallel cable used may be found in T. Lindsay Baker, *Building the Long Star: An Illustrated Guide to Historic Sites* (College Station, Texas: Texas A&M University Press, 1986), 205. Historic American Engineering Record (HAER), National Park Service, U.S. Department of the Interior, "Regency Suspension Bridge," HAER No. TX-61.

two-piece rods are connected by a turnbuckle, and attach to metal stirrups in which the I-beams rest.[4] Ten of these suspender systems, equally spaced the length of the bridge, hold up the deck.

Bridge railing is likely gas pipe. The top rail is larger than the bottom, and is 2-3/8" in diameter; the bottom rail measures 1-7/8" in diameter. The verticals (suspension rods) are also of two sizes, and every other vertical is capped with a decorative finial (casting) measuring 2-3/8" in diameter. The smaller verticals are pinched closed at the top, and are 1-7/8" diameter. End post diameter is 3-1/2".

BRIDGE INSPECTION

Stephen G. Buonopane, structural engineer, inspected the Rock Church Bridge. One of only a few vernacular suspension bridges remaining in Texas, when compared with others like the Beveridge Bridge (HAER No. TX-46), and the Choctaw Creek Bridge (HAER No. TX-85), Buonopane suggests the Rock Church Bridge is the "least mature."[5] He further noted that the pipe railing of the bridge offers no stiffness, and "probably never did." The diagonal cable stays, according to Buonopane, have no means to transfer their horizontal force component into the bridge deck system; hence, the floor beams have buckled.[6]

Despite the engineering deficiencies, the Rock Church Bridge adequately served the needs of the small Central Texas community for over a half a century. As an independent entity, Rock Church, Texas predates Hood County.[7] Whereas the Eleventh Texas Legislature established Hood County in November 1866, the Rock Church community began in 1859.[8] Original settlers, the Jesse Caraway family donated land to build a church. Using rocks from along the river, the farm families built a "rock church." They worshipped there until 1906, but

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[4] It is not known who designed or constructed the Rock Church Bridge, but the stirrups are very similar to those used by the Austin Bridge Company of Dallas, Texas. See also, Historic American Engineering Record (HAER), National Park Service, U.S. Department of the Interior, "Clearfork of the Brazos Suspension Bridge," HAER No. TX-64.

[5] Historic American Engineering Record (HAER), National Park Service, U.S. Department of the Interior, "Beveridge Bridge," HAER No. TX-46 and "Choctaw Creek Bridge," HAER No. TX-85.

[6] Stephen G. Buonopane, Structural Engineer, to Mark M. Brown, Historic American Engineering Record (HAER) Historian, 30 July 2000.

[7] Rhonda H. Calloway, "Hood County," In *The New Handbook of Texas,* vol. 3, p. 686.

[8] Rhonda H. Calloway, "Hood County,". See also Kristi Strickland, "Rock Church, Texas," in *The New Handbook of Texas,* vol. 5, p. 631.

over the years the building evolved to accommodate the Masonic Lodge, and the Rock Church School.[9] Eventually, a cemetery became part of the church grounds.

In 1906, neighbors one again banded together to build a church, this time of white clapboard, but continued to call their meetinghouse the Rock Church.[10] Until the 1970s, the Methodists worshipped there. In 1917, residents of Rock Church community decided they needed a more substantial bridge across the river. The existing rope and wood plank "swinging bridge" allowed pedestrian use, but with a railroad depot and new businesses emerging in nearby Tolar, they wanted a bridge to carry buggies and wagons, too.[11] They retained the same bridge site, because it is one of the places in that stretch of the Paluxy River where the sandy cliffs do not slough off without warning.[12]

It is not known which bridge company built the Rock Church Suspension Bridge. County Commissioner records are incomplete, because of a court house fire in the early 1920s. Forest Caraway remembers a bridge company did build the structure; in fact, a company representative rented a room from the Caraways during the construction. Caraway's grandfather, Jesse, hauled materials to the site in his wagon from the rail depot at nearby Tolar.[13]

The road serving the bridge connected the Caraway land to County Road 2870. By 1971, Hood County eliminated the loop through the Caraway land, thereby, bypassing the bridge.[14] The county maintained the bridge, however, until the mid-1970s. Local residents remember a "dump truck fell through the bridge" shortly before it was taken out of service.[15]

FIRST KNOWN SUSPENSION BRIDGE

In the United States, the first known modern suspension bridge appeared in Uniontown, Pennsylvania in 1801. Built by Judge James Finley, the bridge with its truss-stiffened deck became a nineteenth century standard. Rock Church, as noted, shows no evidence of being designed with that feature. In the 1820s, British bridge engineers experimented with cable-

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[9] Calloway, "Hood County,"

[10] Calloway, "Hood County,"

[11] Forest E. Caraway, telephone interview.

[12] Caraway, telephone interview.

[13] Caraway, telephone interview.

[14] Arial photographs from 1971 and 1991 provided by the U.S. Department of Agriculture, Hood County, Texas, demonstrates the road realignment at Rock Church.

[15] Arial photographs from 1971 and 1991 provided by the U.S. Department of Agriculture, Hood County, Texas, demonstrates the road realignment at Rock Church. When asked about the event, staff at the Hood County Traffic Division does not remember it, nor did maintenance records document the accident.

stayed designs.[16] In Texas, at the end of the 1800s, bridge builders like the Flinn-Moyer Company of Weatherford, Texas, and Edwin E. Runyon, of Cooke County, Texas, constructed several vernacular cable and cable-stayed suspension bridges.[17] The Rock Church Bridge is reminiscent of work by several bridge builders in the state, including Flinn-Moyer, Mitchell & Pigg, and Austin Bridge Company. Unfortunately, no one in the community can remember who built it.

SUSPENSION BRIDGES-THE ROCK CHURCH BRIDGE

Suspension bridges proved popular in Texas, because of the Waco Suspension Bridge, its reliability, beauty, and widespread acclaim. They also, because of their design, proved able to withstand the periodic flash flooding of Texas rivers and creeks. Cost effectiveness is another aspect of the suspension bridges making it suitable to rural Texas stream and river crossings. Gas pipe, plentiful at the time, proved easy to transport by wagon to places off the beaten path, like Rock Church. The metal required little in the way of equipment to cut to length and thread in the field.[18] That local residents helped construct the bridge attests to the construction process.

The Rock Church Bridge, despite a history of inadequate maintenance, and original engineering problems, fulfilled its function of carrying pedestrians and wagons, even automobiles and trucks, across the Paluxy River. Today, more than a century after the community began, and more than a half a century after the bridge opened, people attend yearly reunions the Rock Church Cemetery. Many ask the current owners if they might visit the bridge, some to take family photographs there. As it did for their ancestors who celebrated the opening of their new "swinging bridge" over the Paluxy River, the Rock Church Bridge swaying gently above the sluggish water provides a moment of excitement, and a brief experience of the past.

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[16] Mark M. Brown, "Nineteenth-Century Cable-Stayed Texas Bridges, in *The Fifth Historic Bridge Conference* (Columbus, Ohio: Burgess & Niple, Ltd., 1998): 38.

[17] Brown, "Nineteenth-Century" 40-43.

[18] Brown, "Nineteenth-Century" 40-41.

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